



[7590-01-P]

NUCLEAR REGULATORY COMMISSION

[Docket Nos. 52-027 and 52-028; NRC-2008-0441]

South Carolina Electric & Gas Company and

South Carolina Public Service Authority;

Virgil C. Summer Nuclear Station Units 2 and 3

AGENCY: Nuclear Regulatory Commission.

ACTION: Exemption; issuance.

SUMMARY: South Carolina Electric & Gas Company (SCE&G) and South Carolina Public Service Authority (Santee Cooper) are the holders of Combined License (COL) Nos. NPF-93 and NPF-94, which authorize the construction and operation of Virgil C. Summer Nuclear Station, Units 2 and 3 (VCSNS 2 & 3), respectively.¹ The U.S. Nuclear Regulatory Commission (NRC) is issuing an exemption from the requirement that applicants for an operator license at VCSNS 2 & 3 provide evidence that the applicant, as a trainee, has successfully manipulated the controls of either the facility for which the license is sought or a plant-referenced simulator (PRS). Applicants will instead use a Commission-approved simulation facility for VCSNS 2 & 3.

DATES: This exemption is effective as of **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

¹ SCE&G is authorized by the VCSNS Owners to exercise responsibility and control over the physical construction, operation, and maintenance of the facility, and will be referred to as "facility licensee."

ADDRESSES: Please refer to Docket ID **NRC-2008-0441** when contacting the NRC about the availability of information regarding this document. You may obtain publicly available information related to this document using any of the following methods:

- **Federal Rulemaking Web Site:** Go to <http://www.regulations.gov> and search for Docket ID **NRC-2008-0441**. Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: Carol.Gallagher@nrc.gov. For technical questions, contact the individual listed in the FOR FURTHER INFORMATION CONTACT section of this document.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly-available documents online in the ADAMS Public Documents collection at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "ADAMS Public Documents" and then select "[Begin Web-based ADAMS Search](#)." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The ADAMS accession number for each document referenced (if that document is available in ADAMS) is provided the first time that a document is referenced. The facility licensee's Commission-Approved Simulation Facility application and exemption request was submitted to the NRC by letters dated April 21, 2016 (ADAMS Accession No. ML16112A256) and June 8, 2016 (ADAMS Accession No. ML16161A030), respectively.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

FOR FURTHER INFORMATION CONTACT: Paul Kallan, Office of New Reactors, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-2809; e-mail: Paul.Kallan@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. BACKGROUND

The simulation facility for VCSNS 2 & 3 comprises two AP1000 full scope simulators, which are designated “2A” and “2B”. Both simulators are referenced to VCSNS Unit 2 and are intended to be maintained functionally identical. The simulators are licensed to conform to the requirements of ANSI/ANS-3.5-1998, “Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examination,” as endorsed by Revision 3 of NRC Regulatory Guide 1.149, “Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations.”

On August 3, 2016, the Commission approved the simulation facility under § 55.46(b) of title 10 of the *Code of Federal Regulations* (10 CFR) for use in the administration of operating tests after finding that the simulation facility and its proposed use are suitable for the conduct of operating tests for the facility licensee’s reference plant under 10 CFR 55.45(a). The safety evaluation is available in ADAMS under Accession No. ML16203A116.

II. REQUEST/ACTION

Section 55.31(a)(5) states that to apply for an operator’s or senior operator’s license the applicant shall provide evidence that the applicant, as a trainee, has successfully manipulated the controls of either the facility for which a license is sought or a PRS that meets the requirements of 10 CFR 55.46(c). However, the VCSNS 2 & 3 simulators have not yet been found to meet the NRC’s requirements for PRSs at 10 CFR 55.46(c) because the design activities required by the AP1000 design certification to establish the human factors engineering design for the main control room are incomplete.

The SCE&G requested an exemption from 10 CFR 55.31(a)(5) on June 8, 2016 (ADAMS Accession No. ML16161A030), requesting that the Commission-approved simulation facility be

approved in lieu of a PRS for the performance of significant control manipulations. The Commission has determined that an exemption is warranted from the requirement in 10 CFR 55.31(a)(5) that the applicant for a VCSNS 2 & 3 operator's license use a PRS or the facility to provide evidence of having successfully manipulated the controls of the facility. In lieu of that requirement, the Commission will accept evidence that the applicant, as a trainee, has successfully manipulated the controls of the VCSNS 2 & 3 Commission-approved simulation facility meeting the requirements of 10 CFR 55.46(b).

The staff's evaluation of this action follows.

III. DISCUSSION

Pursuant to 10 CFR 55.11, the Commission may, upon application by an interested person, or upon its own initiative, grant exemptions from the requirements of 10 CFR part 55 as it determines are (1) authorized by law, (2) will not endanger life or property, and (3) are otherwise in the public interest.

1. The exemption is authorized by law.

Exemptions are authorized by law where they are not expressly prohibited by statute or regulation. A proposed exemption is implicitly "authorized by law" if all of the conditions listed therein are met (i.e., will not endanger life or property and is otherwise in the public interest) and no other provision prohibits, or otherwise restricts, its application. As discussed in this section of the evaluation, no provisions in law restrict or prohibit an exemption to the requirements concerning control manipulations.

The regulations in 10 CFR part 55 implement Section 107 of the Atomic Energy Act of 1954, as amended (AEA), which sets requirements upon the Commission concerning operators' licenses and states, in part, that the Commission shall (1) "prescribe uniform

conditions for licensing individuals as operators of any of the various classes of ... utilization facilities licensed” by the NRC and (2) “determine the qualifications of such individuals.”

These requirements in the AEA do not expressly prohibit exemptions to the portion of 10 CFR 55.31(a)(5) that requires the use of a PRS or the facility for control manipulations. Further, as explained below, the exemption has little impact on the uniformity of licensing conditions, and little impact on the determinations of qualifications.

In a letter from Ronald A. Jones, Vice President, New Nuclear Operations, SCE&G to the NRC dated April 21, 2016 (ADAMS Accession No. ML16112A256), the facility licensee requested Commission approval of the simulation facility for VCSNS 2 & 3 to support the administration of operator licensing examinations.

The staff’s evaluation of the simulation facility for VCSNS 2 & 3 concluded that the simulation facility for VCSNS 2 & 3 provides the necessary reactor physics, thermal hydraulic, and integrated system modeling of the reference plant (i.e., the AP1000 plant as described in the design certification) necessary to perform operator license examinations. This modeling includes the predicted core performance instead of the most recent core load. Because VCSNS 2 & 3 is under construction, plant experience from the most recent core load is not available. Predicted core performance is acceptable because operating experience with core design has demonstrated that the reactor physics and thermal hydraulic characteristics associated with a core design can be accurately predicted. As described in the staff’s evaluation of the simulation facility for VCSNS 2 & 3, simulator performance testing has demonstrated that the core performance predictions have been accurately modeled.

The staff’s evaluation of the simulation facility for VCSNS 2 & 3 concluded that the simulation facility for VCSNS 2 & 3 is capable of providing a wide range of scenarios that address the 13 items in 10 CFR 55.45(a) without procedural exceptions, simulator performance exceptions, or deviation from the approved examination scenario sequence. Control manipulations are a subset of actions included in these scenarios and have a defined

scope that is significantly less than an examination scenario. Because of the reduced scope, the presence of existing simulator discrepancies in any training scenarios that provide applicants with the opportunity to provide the required control manipulations is even less likely as compared to operating tests. Therefore, there exists a large variety of control manipulations that can be completed without procedural exceptions, simulator performance exceptions, or deviation from the approved training scenario sequence.

Further, the conditions under which the applicants are licensed will be essentially unchanged, and the usage of the VCSNS 2 & 3 Commission-approved simulation facility in place of a PRS will not significantly change how the Commission determines the qualifications of applicants. Under the exemption, 10 CFR 55.31(a)(5) will continue to require the applicant to perform, at a minimum, five significant control manipulations that affect reactivity or power level.

For purposes of control manipulations, the staff has already determined in its safety evaluation documenting Commission-approval of the simulation facility for VCSNS 2 & 3 (ADAMS Accession No. ML16203A116) that the facility sufficiently models the systems of the reference plant, including the operating consoles, and permits use of the reference plant's procedures. Facility licensees that propose to use a PRS to meet the control manipulation requirements in 10 CFR 55.31(a)(5) must ensure that:

- (i) The plant-referenced simulator utilizes models relating to nuclear and thermal-hydraulic characteristics that replicate the most recent core load in the nuclear power reference plant for which a license is being sought; and

- (ii) Simulator fidelity has been demonstrated so that significant control manipulations are completed without procedural exceptions, simulator performance exceptions, or deviation from the approved training scenario sequence.

In its safety evaluation documenting Commission approval of the VCSNS 2 & 3 simulation facility, the staff found that the VCSNS 2 & 3 Commission-approved simulation facility meets these criteria and, therefore, is equivalent to a PRS with respect to performing control manipulations. Thus, the simulation facility for VCSNS 2 & 3 is an acceptable simulation facility for meeting the experience requirements in 10 CFR 55.31(a)(5).

Accordingly, because a PRS and the VCSNS 2 & 3 Commission-approved simulation facility are essentially the same with respect to control manipulations, an exemption from 10 CFR 55.31(a)(5) allowing the use of the VCSNS 2 & 3 Commission-approved simulation facility in lieu of a PRS or the facility for control manipulations will still satisfy the applicable statutory requirements of the AEA that the Commission prescribe uniform conditions for licensing individuals as operators and determine the qualifications of operators.

The acceptability of the VCSNS 2 & 3 simulation facility with respect to the significant control manipulations required by 10 CFR 55.31(a)(5) is additionally assured by the fact that SCE&G performs scenario-based testing (SBT) for scenarios used to satisfy the control manipulation requirement. To ensure that simulator discrepancies and/or procedure issues do not affect control manipulations, SCE&G, as a standard practice in accordance with its licensing basis, implements SBT in accordance with Revision 1 of Nuclear Energy Institute (NEI) 09-09, "Nuclear Power Plant-Referenced Simulator Scenario Based Testing Methodology."² The NRC staff endorsed NEI 09-09 in Regulatory Guide 1.149, Revision 4. NEI 09-09 describes SBT as follows:

² By letter dated April 21, 2016 (ADAMS Accession No. ML16112A256), SCE&G stated that it conforms to Revision 1 of NEI 09-09.

Key to the SBT Methodology is parallel testing and evaluation of simulator performance while instructors validate simulator training and evaluation scenarios. As instructors validate satisfactory completion of training or evaluation objectives, procedure steps and scenario content, they are also ensuring satisfactory simulator performance in parallel, not series, making the process an “online” method of evaluating simulator performance. Also critical is the assembly of the SBT package – the collection of a marked-up scenario, appropriate procedures, monitored parameters, an alarm summary and an affirmation checklist that serves as the proof of the robust nature of this method of performance testing. Proper conduct of the SBT Methodology is intended to alleviate the need for post-scenario evaluation of simulator performance since the performance of the simulator is being evaluated (i.e., compared to actual or predicted reference plant performance) during the parallel conduct of SBT and scenario validation.

Therefore, since the Commission-approved simulation facility for VCSNS 2 & 3 conforms to the same control manipulation requirements as a PRS, the NRC staff will continue to comply with its requirements governing uniformity and operator qualifications.

Accordingly, for the reasons above, and in light of the reasons discussed in Sections 2 and 3 below, the Commission concludes that the exemption is authorized by law.

2. The exemption will not endanger life or property.

As discussed above, as part of its review and approval of SCE&G’s request for a VCSNS 2 & 3, Commission-approved simulation facility the staff found that the simulator demonstrates expected plant response to operator input and to normal, transient, and accident conditions to which the simulator has been designed to respond. Further, the staff found that the simulator is designed and implemented so that (i) it is sufficient in scope and fidelity to allow conduct of the evolutions listed in 10 CFR 55.45(a)(1) through (13), and 10 CFR 55.59(c)(3)(i)(A) through (AA), as applicable to the design of the reference plant and (ii) it allows for the completion of control manipulations for operator license applicants. Accordingly, the staff concludes that the Commission-approved simulation facility for VCSNS 2 & 3 will replicate reference plant performance for the significant control manipulations required by 10 CFR 55.31(a)(5).

Because the VCSNS 2 & 3 Commission-approved simulation facility satisfactorily replicates reference plant performance with respect to control manipulations, the staff concludes that there is no basis to find endangerment of life or property as a consequence of the exemption.

3. The exemption is otherwise in the public interest.

The Commission's values guide the NRC in maintaining certain principles as it carries out regulatory activities in furtherance of its safety and security mission. These principles focus the NRC on ensuring safety and security while appropriately considering the interests of the NRC's stakeholders, including the public and licensees. These principles include Independence, Openness, Efficiency, Clarity, and Reliability. Whether granting an exemption to the requirement to use a PRS or the facility and allowing use of a Commission-approved simulation facility for VCSNS 2 & 3 would be in the public interest depends on the consideration and balancing of the foregoing factors.

Concerning Efficiency, the public has an interest in the best possible management and administration of regulatory activities. Regulatory activities should be consistent with the degree of risk reduction they achieve. Where several effective alternatives are available, the option which minimizes the use of resources should be adopted. Regulatory decisions should be made without undue delay. As applied to using a Commission-approved simulation facility rather than a PRS or the facility, in light of the Commission's findings that the capabilities of the VCSNS 2 & 3 Commission-approved simulation facility are equivalent to those of a PRS for control manipulations, the use of the VCSNS 2 & 3 Commission-approved simulation facility provides both an effective and an efficient alternative for the VCSNS 2 & 3 operator license applicant to gain the required experience.

Concerning Reliability, once established, regulations should be perceived to be reliable and not unjustifiably in a state of transition. Regulatory actions should always be fully consistent

with written regulations and should be promptly, fairly, and decisively administered so as to lend stability to the nuclear operational and planning processes. Here, where the staff has already found that the VCSNS 2 & 3 Commission-approved simulation facility is equivalent to a PRS with respect to control manipulations, the substantive requirements upon the operator license applicant are unchanged with the granting of the exemption. Further, the public has an interest in reliability in terms of the stability of the nuclear planning process. This exemption aids planning by allowing operator license applicants to complete their applications sooner, with the underlying requirements essentially unchanged, and could result in licensing decisions being made earlier than would be possible if the applicants had to wait for a PRS to be available.

Concerning Clarity, there should be a clear nexus between regulations and agency goals and objectives whether explicitly or implicitly stated. Agency positions should be readily understood and easily applied. For the reasons explained in the NRC's evaluation of the VCSNS 2 & 3 Commission-approved simulation facility, the Commission-approved simulation facility is sufficient for administering operating tests, and is able to meet the requirements of a PRS with respect to control manipulations. The exemption accordingly recognizes that the capabilities of the VCSNS 2 & 3 Commission-approved simulation facility are suitable to accomplish the regulatory purpose underlying the requirements of 10 CFR 55.31(a)(5).

The exemption is also consistent with the principles of Independence and Openness; the Commission has independently and objectively considered the regulatory interests involved and has explicitly documented its reasons for issuing the exemption.

Accordingly, on balance the Commission concludes that the exemption is in the public interest.

Conclusion

The Commission concludes that the exemption is (1) authorized by law, and (2) will not endanger life or property, and (3) is otherwise in the public interest. Therefore, in lieu of the

requirements of 10 CFR 55.31(a)(5), the Commission will accept evidence that the applicant for a VCSNS 2 & 3 operator license has completed the required manipulations on the VCSNS 2 & 3 Commission-approved simulation facility that meets the requirements of 10 CFR 55.46(b), rather than on a PRS or the facility.

Expiration and Limitation

This exemption will expire when a VCSNS 2 & 3 PRS that meets the requirements in 10 CFR 55.46(c) is available. Furthermore, this exemption is subject to the condition that the Commission-approved simulation facility for VCSNS 2 & 3 continues to model the reference plant with sufficient scope and fidelity, in accordance with 10 CFR 55.46(c) and (d).

Environmental Consideration

This exemption allows the five significant control manipulations required by 10 CFR 55.31(a)(5) to be performed on the VCSNS 2 & 3 Commission-approved simulation facility that has been approved for the administration of operating tests instead of on the VCSNS 2 & 3 facility or a PRS.

For the following reasons, this exemption meets the eligibility criteria of 10 CFR 51.22(c)(25) for a categorical exclusion. There is no significant hazards consideration related to this exemption. The staff has also determined that the exemption involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite; that there is no significant increase in individual or cumulative public or occupational radiation exposure; that there is no significant construction impact; and that there is no significant increase in the potential for or consequences from radiological accidents. Finally, the requirements to which the exemption applies involve qualification requirements. Accordingly, the exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(25). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the exemption.

4. This exemption is effective as of **[INSERT DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

IV. CONCLUSION

Accordingly, the Commission has determined that, pursuant to 10 CFR 55.11, issuing this exemption from the requirements in 10 CFR 55.31(a)(5) is authorized by law and will not endanger life or property and is otherwise in the public interest. The Commission will accept evidence of control manipulations performed on the VCSNS 2 & 3 Commission-approved simulation facility instead of on the VCSNS 2 & 3 facility or a PRS.

Dated at Rockville, Maryland, this 11th day of August 2016.

For the Nuclear Regulatory Commission.

Francis M. Akstulewicz, Director,
Division of New Reactor Licensing,
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